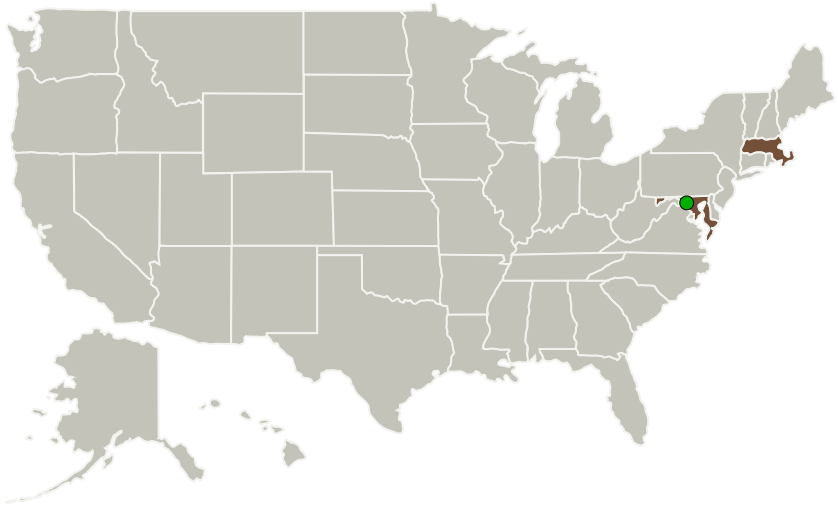
Modified High Gain APDs for Multi-beam Ladar Instrumentation, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

In this effort, Radiation Monitoring Devices, Inc. (RMD) addresses NASA's request for sensitive, high quantum efficiency (QE) optical detectors for space- and ground-based light detection and ranging (Lidar) instruments. We propose to address this need by utilizing our latest designs in solid state photodetectors, and providing optimal receiver solutions needed for NASA's ongoing and future science missions. The solid state photodetectors that will be evaluated for this program will include RMD's large-area, high-gain proportional mode avalanche photodiodes (APD). The focus will be on modification of RMD's existing structure to improve responsivity and bandwidth in the blue and ultra-violet (UV) region of the spectrum. Preliminary studies have shown that UV responsivity and bandwidth of our large area detectors can be increased through the application of a modified surface layer using a well-established processing method. The proposed receiver technology readiness level (TRL) is estimated at 2. The Phase I effort will utilize experimental and theoretical studies to confirm the feasibility of the defined approach, resulting in a prototype design with a TRL of 3-4. In Phase II, the prototype receiver will be fabricated and evaluated. A TRL of 5-6 will be reached by the end of this SBIR program.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Radiation Monitoring Devices, Inc.	Lead Organization	Industry	Watertown, Massachusetts
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Massachusetts

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138322)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Radiation Monitoring Devices, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

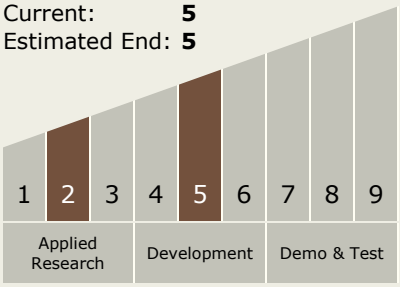
Carlos Torrez

Principal Investigator:

Richard F Myers

Technology Maturity (TRL)

Start: **2**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System